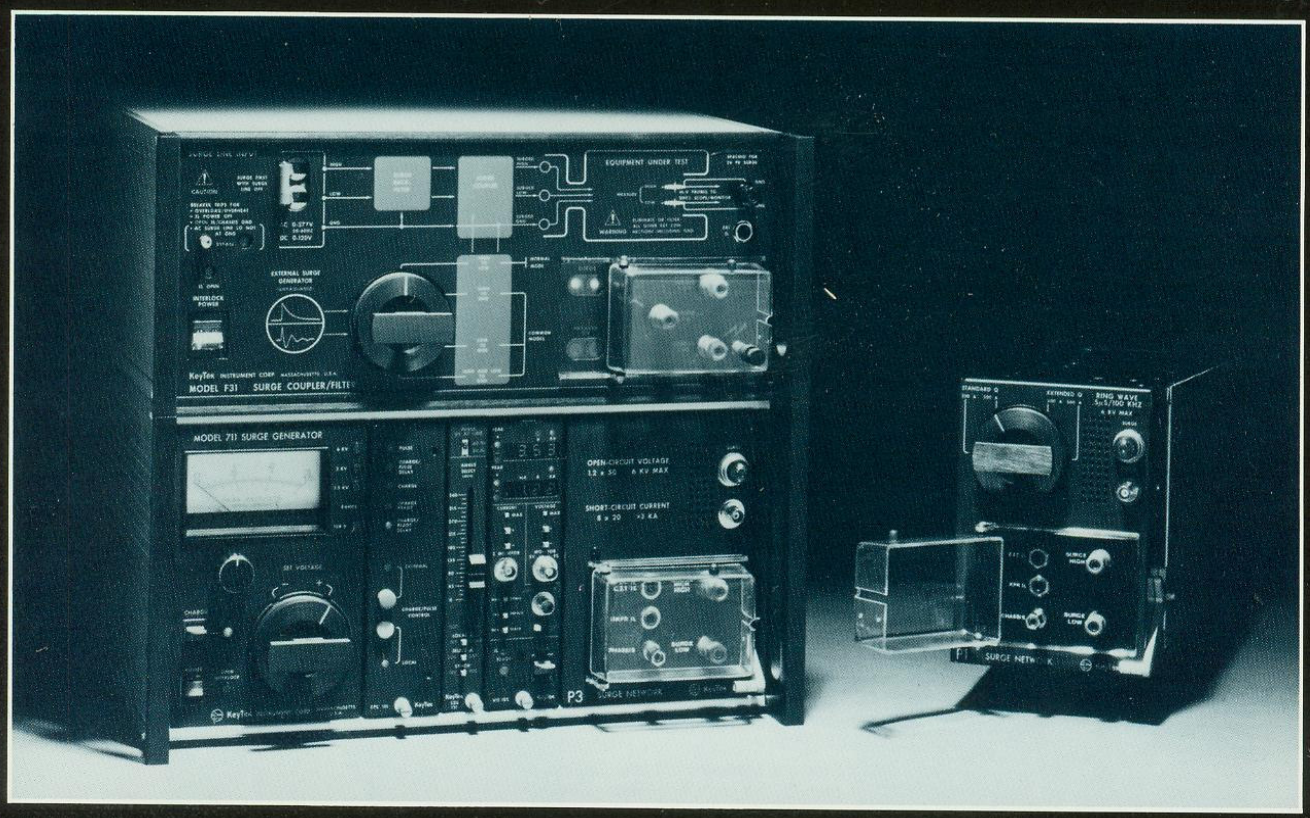
Complete, turn-key instrumentation for generating and coupling to an ac or dc power line, all three surge waves—both impulsive and oscillatory—required by IEEE Standard 587-1980, for both long and short branch circuits.

711A/G, 711A/H and 711A/J SURGE GENERATORS



KeyTek®
INSTRUMENT CORPORATION
260 Fordham Road • Wilmington, MA 01887

TM

A NEW TEST CAPABILITY

The KeyTek 711 A/G, A/H and A/J Surge Generators are designed to meet or exceed requirements of IEEE Standard 587-1980, for surging power lines. All three groups include:

- Model 711A Surge Generator mainframe
- Model P1 .5μs/100 kHz ring wave plug-in Surge Network
- Model P3 1.2 x 50μs impulse plug-in Surge Network

The Groups 711 A/H and A/J also include the KeyTek Model F31 Surge Coupler/Filter. By means of the Model F31, the 711 A/H and A/J can safely and effectively apply their surges to an active power line, without surging other equipment on the same line.

The Group 711 A/G can be converted to a 711 A/H, in factory or in the field, by adding the Model F31.

The 711 A/J, flagship of the line, further extends the 711 A/H by incorporating digital displays for *delivered* peak V and I, measured at the Equipment Under Test; with the V measurement determined by means of a remote, differential probe PV-2 (included). The 711 A/J further includes surge positioning capability versus ac line phase.

711 GROUPS

	A SURGE NETWORKS P1 .5μs/100 kHz Ring P3 1.2 x 50μs Impulse 711A MAINFRAME	B VIS-102P V/I MONITOR and LSU-121 LINE SYNCH	C F31 SURGE COUPLER/FILTER
711 A/G	✓		
711 A/H	✓		✓
711 A/J	✓	✓	✓

PERFORMANCE

A Model 711A Mainframe with Surge Network P1 and P3

Selectable surges for:

Short branch circuits

- 1.2 x 50μs impulse, to 6kV OCV*, 8 x 20μs impulse to >3kA SCI* (stored energy, 216 joules)
- .5μs/100 kHz ring wave (damped cosine): to 6kV OCV*, 500A SCI* (stored energy, 7.2 joules)

Long branch circuits

- .5μs/100 kHz ring wave: to 6kV OCV*, 200A SCI* (stored energy, 7.2 joules)

Selectable ring wave Q for both 200A and 500A: Q ~ 3 (standard, as per IEEE 587), and Q ~ 12 (enhanced, for higher-energy, limit testing).

Includes capability for external switch control of Charge and Pulse operations.

Switch-selectable polarity

Meter to set peak output surge

Floating synch output just prior to surge

Full interlock system prevents surging unless all interlocks (including external) are closed.

B VIS-102P and LSU-121 Modules

- External peak V and I monitoring, and digital displays, via plug-in Model VIS-102P. Includes remote, differential probe PV-2.

  Floating voltage monitor output, scaled so that 10V = 10,000 V surge.

  Floating current monitor output, scaled so that 1V = 10A, 100A or 1000A surge.
- Surge positionable with respect to ac line phase angle (50/60 Hz), via plug-in Model LSU-121.

C Model F31 Surge Coupler/Filter

Selectable surge coupling modes:

Normal mode

line 2 to line 1

All three common modes:

line 1 to ground
line 2 to ground
lines 1 and 2 to ground

Power line:

0-277 V, 50-60 Hz
0-120 V dc
To 10A continuous, 15A intermittent

Separate surge-line circuit breaker:

Surging with or without power applied. Breaker fully interlocked — trips if any interlock condition is violated.

Applied surge:

The ac or dc surge-line is filtered for surges including the 100kHz ring wave to 6kV and 500A, and the 1.2 x 50μs impulse to 6kV and 3kA.

Options and Other Models:

- Surge-line current to 20A continuous, 30A intermittent, with Option E-F31 (factory only).
- Surge 3-phase lines with all 6 normal and all 7 common modes, with a KeyTek Model F33.

*OCV = open-circuit voltage
SCI = short-circuit current

Repetitive and/or remote-command surging:

Optional for any of the three groups, via replacement of an internal module with Auto/Remote Option ARU-151.

For more sophisticated remote command surging, factory conversion of Model 711A to Model 711B permits use of Auto/Remote Option ARU-151A. (The 711B can then also accept the programmable VIS-102PR.)

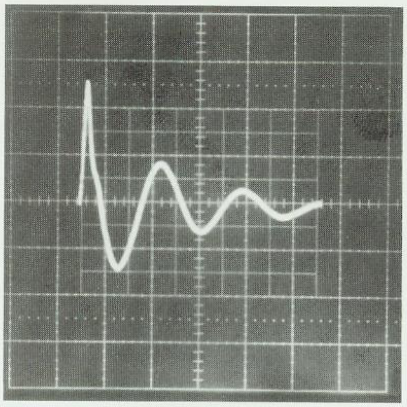
PHYSICAL

711A	100/120/220/240V 50-60 Hz, 100w avg, 20A max	17¾" w x 8¾" h x 21¼" d (45.1 x 22.2 x 54.0 cm)	65 lbs (29.6 kg)
P1, P3		Alternate plug-ins for 711A	20 lbs (ea) (9.1 kg)
F31	100/120/220/240V	17¾" w x 7" h x 22¼" d	70 lbs

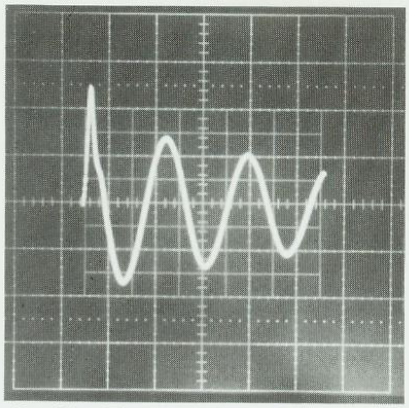
SURGE GENERATION TO MEET AND EXCEED IEEE Std 587-1980

Category A
LONG BRANCH CIRCUITS
(At the standard 15-20A wall outlet)

Ring Waves Only



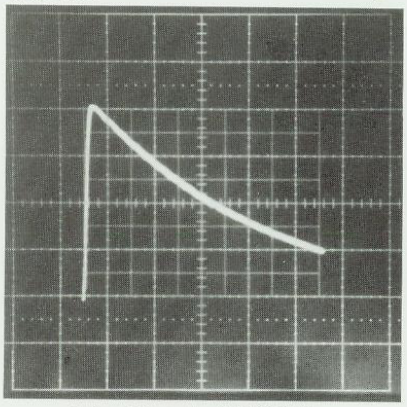
.5μs Rise Time/100 kHz, to 6kV OCV*.
To *200A* SCI*; standard IEEE 587 Q ~ 3.



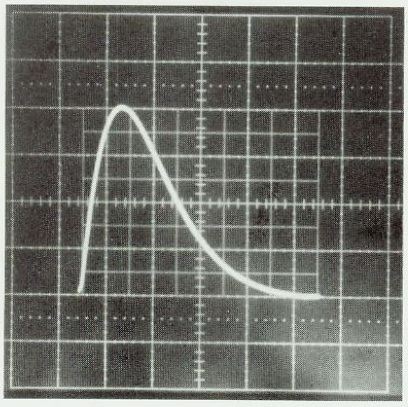
.5μs Rise Time/100 kHz, to 6kV OCV*.
To *200A* SCI*; *enhanced* Q ~ 12, selectable for higher-energy, limit testing.

Category B
SHORT BRANCH CIRCUITS
(At the breaker box: industrial lighting, large computers, etc.)

Impulse

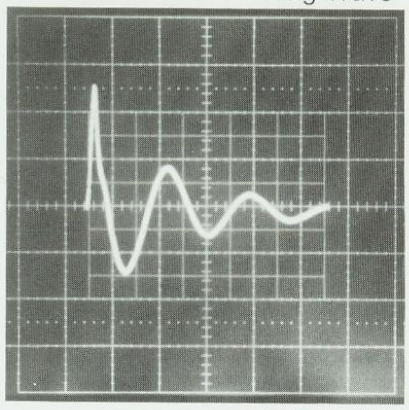


1.2 x 50μs, to 6kV OCV*

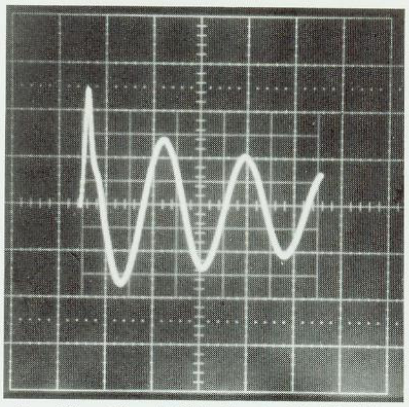


8 x 20μs, to > 3kA SCI*

Ring Wave



.5μs Rise Time/100 kHz, to 6kV OCV*.
To *500A* SCI*; standard IEEE 587 Q ~ 3.



.5μs Rise Time/100 kHz, to 6kV OCV*.
To *500A* SCI*; *enhanced* Q ~ 12, selectable for higher-energy, limit testing.

*OCV = open-circuit voltage, SCI = short-circuit current

THE FULL KEYTEK 711 SERIES FOR SURGE-TESTING CIRCUITS AND SYSTEMS

The 711 Series is a compact, modular set of instrumentation, specifically designed for precision surge generation and measurement. It may be expanded via companion units and additional-capability, plug-in option-modules at any time, to provide the widest possible range of both features and performance.

Dedicated module and auxiliary equipment Groups are available within the 711 Series to meet important specifications — IEEE Std. 587, CCITT Rec K. 17, FCC 19528 Part 68, IEC 664, SAE-J1113a, UL943 and so on. In addition, there is wide latitude within each Group for selection of additional functions — surge positioning vs. ac line phase, peak readouts using remote probes, and automatic surging; including automatic advance for ac line-surge placement angle.

Finally, via additional options, key functions are remotely programmable — including peak output voltage and ac line-surge placement angle; and both remote-probe-measured peak surge voltage and peak surge current are available for remote printout and data manipulation. These various automatic- and remote-programmable features make the 711 Series ideal for computer-controlled, diagnostic surge testing of both circuits and systems.

711 SERIES EQUIPMENT SUMMARY

Mainframes	711A	6kV energy source Surge generation controls Timing, operating circuits (including external switching for Charge/Pulse) High-voltage switching, interlocks Receptacles for plug-in Surge Networks and performance-option modules
	711B	Same as 711A, but also includes ability to accept modules and options for fully-remote, computer-controlled operation: VIS102PR ARU-151A
Companion units, for active line driving	F31	Line Coupler/Filter; line-to-line and all 3 common modes. 10A continuous, 15A intermittent. Options available for 20A and 50A continuous. Both 277V and 480V versions are standard.
	F33	Line Coupler/Filter for 3-phase, up to 5 wire systems. All significant coupling modes. Currents of 20A and 50A. 277V and 480V versions available.
Performance-option plug-in modules, for		
Peak V/I monitoring:	VIS-102P	Adds digital displays for peak V **delivered to the load** (includes remote V probe PV-2); plus peak surge I.
	VIS-102PR	Adds remote BCD outputs (with Model 711B only)
Surge positioning vs ac line phase (for use with F31 or F33):	LSU-121	0-360° manual surge positioning for 50/60 Hz lines.
	LSU-122	Adds automatic phase-angle advance after N surges (selectable from 1 to 9) at each angle. 15/90 degree steps, forward and back.
Repetitive (auto) and remote, logic-controlled surging:	ARU-151	Repetitive surging at controllable rate, plus remote logic-controls (manual polarity selection)
	ARU-151A	Adds alternating polarity option to repetitive, plus remote-polarity selection capability (with Model 711B only).

Surge networks*	P1	6kV, 0.5μs/100 kHz ring wave; 200A and 500A; Q ~ 3 and Q ~ 10	IEEE Std. 587-1980 (Cat. A plus first half of Cat. B); UL943, 217, 268
	P3	1.2 x 50μs, 6kV 8 x 20μs, ~ 3kA	IEEE Std. 587-1980 (second half of Cat. B); IEC 664
	P7	1.2 x 50μs, 6kV 8 x 20μs, >10kA at front panel (4-8kA with F31/F33)	Extended version of P3
	P9	10 x 160μs, 1500V (200A) 10 x 560μs, 800V (100A) 2 x 10μs, 2500V (1kA)	FCC Docket 19528 Part 68
	P21	0.5 x 700μs, 6kV 10 x 700μs, 6kV 100 x 700μs, 5kV	CCITT Rec. K17
	P41	0 to +150V peak, exp decay, TC ~ 230ms, 50A max	SAE J1113a, auto load dump
		0 to −100V peak, exp. decay, TC ~ 8ms, 220A max	SAE J1113a, auto field decay

***All voltage and current values are maxima; full control from 0 to these figures is standard on all models, to facilitate diagnostic surge testing.**

KeyTek®
INSTRUMENT CORPORATION
260 Fordham Road • Wilmington, MA 01887
(617) 658-0880 Telex 951389

KPS-113 C

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